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Success Story

SENSORS DIRECTORATE TECHNOLOGY IMPROVES PREDATOR B SURVIVABILITY

The Sensors Directorate's Electro-Optical Countermeasures Technology Branch at Wright-Patterson Air Force Base, Ohio developed an improved paint scheme for the second-generation MQ-9 (Predator B) unmanned air vehicle (UAV). They designed the improved paint scheme specifically for the Predator B and its operational environment to reduce visual detection, acquisition, and/or tracking, therefore improving its survivability.

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Accomplishment

The visual detection range of an aerial vehicle is highly dependant on its paint scheme, flight profile, environment, and the location and attitude of the observer (input conditions). The directorate used the optical encounter model to effectively evaluate the trends that would be caused by this set of input conditions.

Given the conditions provided by the program office and experience gained by a previous effort for the Predator SPO, a number of possible paint schemes varying in design (single or multiple grays, etc.) and reflectance values were defined. A simple pattern was chosen because detection, not camouflage, was the primary interest. The paint scheme providing the best overall performance was a medium to dark gray paint at 20% on the bottom of the UAV and a 37% reflective paint on the top portion. The directorate determined and recommended to the Aeronautical Systems Center the improved paint scheme, which they adopted and sent to the Air Command Center for approval.

Background

The Predator B aircraft required an appropriate paint scheme to optimize operations in a tactical environment. The original Predator UAV paint scheme was not designed to minimize visual detection. Since many anti-aircraft systems rely on visual detection, acquisition and/or tracking, repainting the Predator B with a scheme that is designed specifically for its operational environment would greatly improve its survivability.

The directorate was requested to evaluate and recommend an appropriate paint scheme based on its visual signature and vulnerability to human or optically aided anti-aircraft fire. The directorate performed a study that outlined findings concerning the vehicles visual signature during normal operating flight paths and altitude levels. The directorate used an optical encounter simulation model to study six potential paint schemes, and the conclusion was that a two-tone gray scheme offered the best protection for all given parameters.

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Additional information

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